



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,791	09/22/2005	Kiyotaka Yasuda	8007-1087	6850
466 7590 01/06/2011 YOUNG & THOMPSON 209 Madison Street Suite 500 Alexandria, VA 22314			EXAMINER YANCHUK, STEPHEN J	
			ART UNIT 1729	PAPER NUMBER
			NOTIFICATION DATE 01/06/2011	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

Office Action Summary

Application No.

10/522,791

Applicant(s)

YASUDA ET AL.

Examiner

STEPHEN YANCHUK

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3.5 and 6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3.5 and 6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. All outstanding objections and rejections are withdrawn in light of applicant's amendment filed through RCE and amendment on 5/14/2010.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in prior office action.

Claim Rejections - 35 USC § 102

1. Claims 1-3, 5-6 are rejected under 35 U.S.C. 102(b) as being unpatentable over Hisaki et al. (CN 2423608).

Claim 1, 3: teaches a lithium secondary battery comprising an anode. The anode comprises a copper current collector and electrolyte with an active material thin film therebetween [Pg 17]. An anode thin film active material is made of silicon [Pg 20-22]. It is taught that copper is diffused in the thin film [Pg 14 Ln 10-20]. The proportion of the current collector material diffused in the thin film active material is taught to be greater near the current collector [Pg 15]. It is taught that the thin film active material have gaps and columnar portions to absorb stress generated by expansion [Pg 8 L 7-20, Pg 14 Ln 21-25]. The total thickness is taught to be between 1-20 μ m [Pg 17]. Interstices exist as an intermediary step wherein the current collector material is diffused into.

Claim 2: The electrode functions. The metallic copper material makes up the surface and is present over the whole thickness of the active material and is also the current collector [Pg 20-22].

Claim 5: The current collector is taught to be copper [Pg 13 Ln 17-25].

Claim 6: The thin film is created via electroplating [P 12 Ln 20].

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al (JP 2002-289177).

Claim 1, 3: Nishimura teaches a thin film of active material deposited on the collector with silicon as a component with copper throughout [8] as an anode [14]. A current collector is taught to be copper, nickel, steel, molybdenum, tungsten, and tantalum [12]. Charge collecting material is found throughout the active material wherein there is an increased gradient near the current collector [11]. This is interpreted that a current collecting material exists with two surfaces wherein the concentration of metallic material decreases toward the electrolyte. The surface closest to the electrolyte is taught to have breaks in the thickness direction and have dissociated pillar-shapes [13]. The breaks and pillar shapes form micro voids therebetween to provide fluid communication between the surface of the collecting surface layers and the active material. Copper is taught to be dissolved to the silicon whereby a void in an interstices exists for the copper to dissolve to [13]. Claiming an

intermediary step of formation of a structure does not render the structure novel over the prior art. The prior art does not teach a thickness.

It would have been obvious to one of ordinary skill in the art to find the optimal thickness of the current collecting surface through routine experimentation to have it small enough to save on cost and space, but large enough to provide optimal electrical features.

A. Optimization Within Prior Art Conditions or Through Routine Experimentation

Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Allen*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be *prima facie* obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%); see also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable thereover because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions). For more recent cases applying this principle, see *Merck & Co., Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); *In re Kolling*, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

Further it is interpreted that a "surface layer" of the anode are in contact with the electrolytic solution. This limitation does not account for a middle layer and other surface layer not in contact with the electrolytic surface. The current claim limitation does not account for the total thickness of the anode or the active region material.

Claim 2: Nishimura teaches current collecting material existing throughout the active material region [11-13].

Claim 5: The current collector material that exists throughout the material is taught to be copper, nickel, steel, molybdenum, tungsten, and tantalum [12].

Claim 6 defines the product by how the product was made. Thus, claim 6 is a product-by-process claims. For purposes of examination, product-by-process claims are not limited to the manipulation of the recited steps, only the structure implied by the steps. See MPEP 2113. In the present case, the recited steps imply a structure having an active material on top of the current collector with current collecting material throughout the active material. The reference suggests such a product.

Response to Arguments

4. Applicant's arguments with respect to claims 1-3. 5-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN YANCHUK whose telephone number is (571)270-7343. The examiner can normally be reached on Monday through Thursday 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-277-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STEPHEN YANCHUK/
Examiner, Art Unit 1795

/Ula C Ruddock/
Supervisory Patent Examiner, Art Unit 1795